

The role of rectosigmoid neocolporrhaphy

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Background. Vaginoplasty for congenital vaginal atresia, a component of the Mayer-Rokitansky-Kuster syndrome, or for gender confirmation, may be achieved by several techniques. This report focuses on the efficacy of rectosigmoid neocolporrhaphy (RSNC) performed either primarily or secondarily after failure of another procedure.

Methods. Sixty patients underwent isoperistaltic RSNC, three primarily and 57 secondarily. The indication was vaginal atresia in 1 patient and gender dysphoria in 59 patients.

Results. All 60 patients survived and have a functional neovagina. One major complication, an anastomotic leak with colovaginal fistula, was treated by a temporary colostomy and later reconstruction through a combined anterior and posterior approach. Late complications were reversible stomal stenosis (six patients), reversible conduit narrowing (five patients), transient rhabdomyoblastosis (one patient), and temporary mucosal bleeding from hyperplasia (three patients). Thirty patients have regular intercourse, 12 patients have occasional intercourse, and the others feel "whole," with their intact desired sexual anatomy awaiting a suitable partner.

Conclusions. The number of patients seeking vaginoplasty is increasing. Primary or secondary RSNC is a safe and effective method. (Surgery 1997;122:856-60.)

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VAGINOPLASTY FOR CONGENITAL vaginal atresia, one of the features of the Mayer-Rokitansky-Kuster syndrome, or for gender confirmation may be achieved by a number of techniques.¹ McIndoe,² in 1938, described the classic perineal approach. The procedure involves perineal and pelvic dissection between the rectum and the urinary tract structures with later split-thickness skin graft. Maintenance of vaginal size with obturators can give good functional result. The perineal approach in patients with gender dysphoria permits the use of inverted penile and/or scrotal skin after penectomy and orchiectomy as the inner lining of the new vagina.^{2,3}

Although the use of an isolated bowel segment as a new vagina was described in 1892, this approach received little application until 1911.⁴ Freundt et al.,⁵ in 1992, reported this modified approach in 40 patients with good results. The pre-

sent study summarizes the long-term results of rectosigmoid neocolporrhaphy (RSNC) in 60 patients.

CLINICAL MATERIAL

Sixty patients had RSNC using an isolated isoperistaltic segment from 1983 to 1996. The average age was 27 years (range: 18 to 55 years). The average weight was 157 pounds (range: 126 to 285 pounds). The RSNC was the primary vaginoplasty in three patients and was done secondarily in 57 patients who failed a prior perineal vaginoplasty. The latter 57 patients is about 30% of 190 patients who have had perineal vaginoplasty with perineal split-thickness skin grafts used as the inner lining. RSNC was done for vaginal atresia in one patient with the Mayer-Rokitansky-Kuster syndrome and for gender conflict in 59 patients. All of the latter patients were followed by an extensive protocol, created and promulgated by the Harry Benjamin International Gender Dysphoria Association (HBIGDA).⁶

RSNC was performed with both abdominal and perineal teams working simultaneously with the patient in the lithotomy position. The perineal team excised the residual scar tissue and skin graft from the prior perineal vaginoplasty and removed a portion of the pelvic floor muscle to create suffi-

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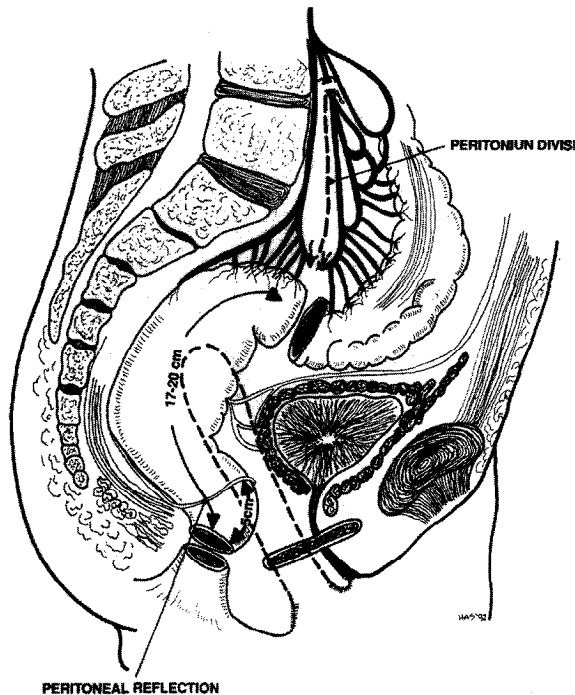


Fig. 1. A representation of the dissection; one of the possible arterial patterns is shown. The transfer site is indicated by the interrupted line.

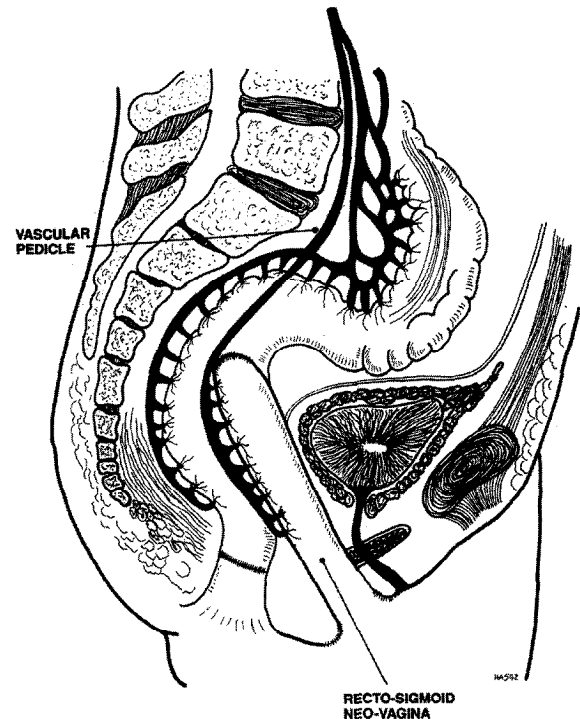


Fig. 2. The completed surgery. The cross-hatching indicates the suture lines.

cient space in the lower pelvis and perineum to accommodate the RSNC.

The abdominal team prepared the RSNC. A transverse incision was made within the pubic hair-line about 1 1/2 inches above the pubis through both recti muscles. After entering the abdomen and completing a lower abdominal exploration, the small intestine was retracted superiorly, and the sigmoid colon was mobilized from its lateral retroperitoneal attachments to the avascular preaortic plane. The rectosigmoid mesentery containing the superior hemorrhoidal vessels was protected as the posterior peritoneum was incised bilaterally to the level of the retrovesical fold of Douglas. The rectosigmoid mesentery was bluntly dissected away from the deep pelvic structures in the avascular posterior and posterolateral plains down to the level of the coccyx. The anterior rectal wall was exposed immediately posterior to Denonvillier's fascia. This anterior dissection extends behind the base of the bladder for 5 to 6 cm beyond the peritoneal reflection from the anterior rectal wall. This is an important landmark because the rectum was divided about 3 cm beyond this reflection to ensure adequate length for the RSNC to reach the perineum without vascular compromise. The rectal and mesentery transection was done by electrocoagulation or by sharp dissection

while maintaining firm hand pressure around the rectum and mesentery to control bleeding. No clamps were used. Bleeding from the distal stump was controlled by electrocautery or by a pelvic pack. The sigmoid colon was divided 20 cm proximal to the rectal division. The exact point of division varied slightly according to the vascular arcade. The distal end of the divided sigmoid colon was sutured closed with absorbable sutures. The sigmoid mesentery near the point of sigmoid transection was partially divided proximal to the inferior mesenteric artery; this usually provided enough freedom for the RSNC to reach the perineum without tension. Additional length can be obtained by incising the sigmoid peritoneum proximal to the inferior mesenteric artery when one or two of the sigmoid vessels has to be sacrificed. The inferior mesenteric artery can be mobilized in this manner to its point of origin (Fig. 1). After confirming that the RSNC reached the perineum without tension, the RSNC was returned to the abdomen and the intestinal reconstruction was performed with a single layer of 3-0 interrupted sutures. The posterior wall was sutured first with the knots on the inside to facilitate inversion and appropriate approximation with each suture. Once the posterior wall has been completed, the anterior wall was completed using the same suture technique. The final anastomosis was about 6 or 7 cm from the anal verge.

After gastrointestinal reconstruction, the RSNC was returned to the perineum for suturing; the RSNC was stented with an appropriate obturator (Fig. 2). Two closed suction drains were placed in the deep pelvis and brought out the perineum on each side of the neovagina. The operation was completed in 3 to 4 hours. Blood transfusion was seldom required except in patients with excessive perineal scar tissue. The postoperative course was similar to other gastrointestinal operations; the length of hospital stay was directly related to the return of bowel function and the ability to tolerate diet.

RESULTS

All 60 patients survived. There was one major complication, an anastomotic leak, which presented on day 7 as a colovaginal fistula. This was treated initially by a proximal colostomy followed by later reconstruction. The initial reconstruction effort using the posterior transcoccygeal approach failed; the stenotic anastomosis was mobilized, but there was inadequate length of the intestine proximal to the anastomosis, thereby precluding a tension-free reconstruction. A second reconstruction used a combined anterior and posterior approach with full mobilization of the transverse, splenic, and descending colon segments to obtain sufficient length for a safe one layer anastomosis from the posterior approach. That patient recovered uneventfully and has a functioning RSNC. There were no wound complications or significant bladder or rectal dysfunction beyond the initial hospital stay.

A number of late complications occurred 1 or 2 years postoperatively. One patient had a small bowel obstruction, which required lysis of adhesions. Two patients required admission for pelvic peritonitis caused by obturator rupture of the neovagina. Both patients were treated nonoperatively and recovered fully. One patient had a localized area of rhabdomyoblastosis in the neovagina. This lesion was thought, on initial biopsy, to be a rhabdomyosarcoma, but subsequent biopsies failed to confirm this diagnosis. The lesion gradually regressed over the next 6 months and has not recurred. The cause of this lesion is not known. Six patients had some degree of stomal stenosis, with or without partial mucosal prolapse. These problems were corrected by simple local surgery and reinstitution of stenting. Five patients who failed to use their stent regularly or to establish regular intercourse had some degree of conduit narrowing. These were restored to proper size by reinstitution of a regular pattern of obturator dilation.

Three patients had minor subjective symptoms; no cause was identified. Three patients had contact bleeding as a result of mucosal hyperplasia. A daily Betadine douche eliminated this problem.

Long-term follow-up showed that 30 patients had regular or frequent intercourse, 12 patients had occasional intercourse, whereas, the remaining persons were abstinent, although the new vaginas were functionally adequate. These latter patients believed that the neovagina provided psychological support for their new sexual confirmation as females. A sense of being "whole" and being their desired sex anatomically were important. Interestingly, the psychiatrists were unable to predict accurately in the preoperative period which patients would have active intercourse postoperatively. All gender-conflicted patients were advised to follow-up with the psychiatric services; many patients, however, did not use this service once they had achieved their goals. Postoperatively, none of the patients required psychiatric care for depression or suicidal ideology.

The 57 patients undergoing the secondary vaginoplasty by RSNC were able to compare the RSNC with perineal vaginoplasty and skin grafting. The RSNC was associated with less dryness, less irritation, and fewer problems with reduced size. These patients learned that a decrease in size could be corrected easily after RSNC but not after the perineal vaginoplasty.

DISCUSSION

Vaginal reconstruction has been attempted for almost two centuries. The techniques can be classified into three categories. Early methods included dilation of rudimentary pits or primordial vaginal structures.⁷ The success rates were poor. When the procedure was successful, prolapse was common because of the lack of supporting ligaments. Dissection of a perineal and pelvic cavity, which is lined by a full-thickness skin flap rotation, split-thickness skin graft, or some combination of both, was more widely used after 1930.^{2, 8-10} Perineal dissection with split-thickness skin grafting was used as the primary procedure by one of the authors (A.N.W.) in 190 patients. This 30% failure rate with perineal vaginoplasty and split-thickness skin graft is comparable to other reported series.^{1, 11, 12} The reason for failure in the 57 patients undergoing secondary RSNC was due to a combination of factors including stenosis, irritation, dryness, and bleeding. When contraction and stenosis occur, the rate of contraction is quite rapid and cannot be controlled by dilatation. This complication consti-

tutes an absolute indication for one of the gut transfer procedures.¹

The use of isolated gut segments for vaginoplasty began in 1892 and was later improved by Schubert,⁴ in 1911. Baldwin,¹¹ in 1904, was the first American to report vaginoplasty with the gastrointestinal tract; he used an isolated segment of ileum for the new vagina. Schmid,¹² in 1952, described 10 patients in whom he used the sigmoid colon for vaginoplasty. Aleksandrov,¹³ in 1955, reported on a series of 167 patients who underwent vaginal reconstruction with the sigmoid colon; three patients died. Except for an occasional isolated report, all of these series emanated from the European literature.

Laub et al.¹, in 1988, reviewed a collective series of 700 patients undergoing rectosigmoid vaginal replacement and added 45 patients from their own practice. The present series represents the largest series in which the RSNC was performed in an isoperistaltic manner. The use of the hand-sewn end-to-end anastomosis differs from the series reported by Laub in which the anastomosis was stapled. The use of the hand-sewn low rectosigmoid anastomosis was preferred to avoid the frequent postoperative problems with large bowel dysfunction, which may occur during the first 3 to 6 months after a low end-to-end stapled anastomosis.¹⁴

RSNC provides an excellent vaginal substitute, which has adequate length, diameter, and strength with a mucosal lining that secretes mucus on physical stimulation. When the segment is mature, the perineum remains dry and free from secondary infection. Perineal pads are not required. The lining is resistant to infections. When one uses more proximal segments of the alimentary canal for vaginal reconstruction, the increased secretory function in these more proximal segments persists in the transferred position and is an inconvenience. The RSNC may contract, especially if the segment is not used for intercourse or stented. This problem can be reversed with graduated plastic dilators until the desired size is again achieved. Isolated segments of the rectosigmoid are not immune to inflammatory colon diseases.^{15,16} Except for the one patient who had rhabdomyoblastosis, there were no rectocolonic diseases in these 57 patients. Because of the 30% failure rate of perineal vaginoplasty, one may propose that RSNC be continually used as the initial procedure.¹ The perineal approach, however, does produce satisfactory results in 70% of patients, who thus avoid the more invasive RSNC, which may have life-threatening complications.

The incidence of male-to-female gender conflict in the Netherlands has been estimated to be 1 in 35,000.⁵ The incidence of vaginal aplasia, a typical feature in the Mayer-Rokitansky-Kuster syndrome, ranges from 1 in 4000 to 8000.¹⁷ There is no accurate assessment of the incidence of vaginal destruction from disease, postpartum necrosis, or vaginectomy. All patients with gender conflict met the standards of the HBGDA.⁶ Preoperative psychiatric counseling was mandated for 5 years with cross-dressing as females 24 hours a day for 2 years. Patients were selected for surgical intervention by the psychiatric service. All patients had follow-up in both the surgical and psychiatric services.

The number of patients requesting vaginal reconstruction is increasing throughout the United States. As these procedures move from the more experimental to the feasible with predictable and satisfactory long-term results, the issues of case selection must continue to evolve. Part of this evolution will be based on the results of patients who have undergone one or more vaginoplasty procedures.

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DISCUSSION

Dr. Norman C. Estes (Kansas City, Kan.). Gender identification is a significant problem that has many psychological aspects. This surgical advancement may offer some advantages for some of these patients, as well as for those in whom gender identification is not the issue.

Dr. Lucas. I would emphasize that it is rewarding to help a young lady born with vaginal atresia based on the techniques that are learned in doing this operation for other reasons.

Dr. Monica Morrow (Chicago, Ill.). You mentioned that a potential use for this procedure was in the cancer patient, although none of the patients in your series had cancer. Since many patients with gynecologic cancer will receive full dose pelvic radiation therapy, do you think this technique is suitable for use in someone whose pelvis has been irradiated?

Dr. Lucas. I believe it would be very difficult to use this technique in the irradiated pelvis. This procedure has been used in young girls in whom vaginal cancer developed from intrauterine exposure to carcinogens.

ANNOUNCEMENT

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